IN THE CLAIMS:

1. (Currently Amended) A direct methanol fuel cell system comprising:
a direct methanol fuel cell, including:
an anode;
a cathode;
a membrane electrode assembly including a protonically-conductive membrane having first and second surfaces on which catalysts are disposed, anode and cathode diffusion layers disposed, respectively, on said catalysts;
a source of [[neat or concentrated methanol]]fuel;
a conduit for delivering a first fuel mixture to an anode aspect of the fuel cell;
a conduit bypassing at least a portion of said first fuel mixture conduit and being coupled to said [[methanol]] fuel source and to one or more valves [[for delivering neat or concentrated methanol to said anode]]; and
a controller coupled to said one or more valves and, responsive to [[an increase in demand for output power from]] a change in operating conditions of said fuel cell, operating to actuate one or more of said valves to allow [[neat or concentrated methanol]] a more concentrated fuel to be delivered to said anode.

2. (Cancelled) A direct methanol fuel cell system comprising:
a direct methanol fuel cell including
an anode including an anode flow field plate;
a cathode including a cathode flow field plate;
a membrane electrode assembly including a protonically conductive membrane having first and second surfaces on which catalysts are disposed, anode and cathode diffusion layers disposed, respectively, on said catalysts;

a source of neat or concentrated methanol;

a pump coupled to said methanol source and said anode for pumping fuel to said anode flow field plate;

a conduit coupled to said methanol source and to one or more valves for delivering neat or concentrated methanol to said anode diffusion layer, said conduit extending through said anode flow field plate into said anode diffusion layer; and

a controller coupled to said one or more valves and, responsive to an increase in demand for output power from said fuel cell, operating to actuate one or more of said valves to allow neat or concentrated methanol to reach said anode diffusion layer.

3. (Cancelled) A diffusion layer for use in a direct oxidation fuel cell comprising: a layer of material having a first surface which is oriented to receive fuel and a second surface from which diffused fuel passes, said layer including one or more apertures extending from said first surface to said second surface, said one or more apertures for allowing neat or concentrated fuel to effectively bypass said diffusion layer.

4. (Currently Amended) [[The diffusion layer as in claim 3]] A diffusion layer for use in a direct oxidation fuel cell comprising:

a layer of material having a first surface which is oriented to receive fuel and a second surface from which diffused fuel passes, said layer including one or more apertures extending from said first surface to said second surface, said one or more apertures for allowing a more concentrated fuel to effectively bypass said diffusion layer wherein said one or more apertures are connected by one or more conduits and one or more valves to a source of concentrated fuel in such as manner that at least a portion of a first fuel mixture conduit is bypassed, and a more concentrated fuel is delivered via said apertures.

5. (Currently Amended) [[The diffusion layer as in claim 3]] A diffusion layer for use in a direct oxidation fuel cell comprising:

a layer of material having a first surface which is oriented to receive fuel and a second surface from which diffused fuel passes, said layer including one or more aper-

tures extending from said first surface to said second surface, said one or more apertures for allowing a more concentrated fuel to effectively bypass said diffusion layer wherein said one or more apertures are lined with a material which is substantially impermeable to said fuel, thereby inhibiting said fuel from migrating laterally into said diffusion layer.

6. (Currently Amended) A membrane electrode assembly for use with a direct oxidation fuel cell, said assembly comprising:

a protonically conductive membrane having first and second surfaces on which catalysts are disposed;

anode and cathode diffusion layers disposed, respectively, on said catalysts, said anode diffusion layer having a first surface which is oriented to receive fuel and a second surface in contact with said catalyst, and one or more apertures extending through the thickness of said anode diffusion layer, said one or more apertures for allowing [[neat or]]a more concentrated fuel to effectively bypass said diffusion layer and wherein said one or more apertures are connected by one or more conduits and one or more valves in such as manner that at least a portion of a first fuel mixture conduit is bypassed .

7. (Cancelled) The membrane electrode assembly as in claim 6 wherein said one or more apertures are connected by one or more conduits and one more valves to a source of fuel.

8. (Currently Amended) A membrane electrode assembly for use with a direct oxidation fuel cell, said assembly comprising:

a protonically conductive membrane having first and second surfaces on which catalysts are disposed;

anode and cathode diffusion layers disposed, respectively, on said catalysts, said anode diffusion layer having a first surface which is oriented to receive fuel and a second surface in contact with said catalyst, and one or more apertures extending through the thickness of said anode diffusion layer, said one or more apertures for allowing a more concentrated fuel to effectively bypass said diffusion layer [[The membrane electrode

assembly as in claim 6]] and wherein said one or more apertures are lined with a material which is substantially impermeable to said fuel, thereby inhibiting said fuel from migrating laterally into said diffusion layer.

9. (Cancelled) A direct methanol fuel cell comprising:

an anode;

a cathode;

a membrane electrode assembly including a protonically conductive membrane having first and second surfaces on which catalysts are disposed, anode and cathode diffusion layers disposed, respectively, on said catalysts, said anode diffusion layer having a first surface which is oriented to receive fuel and a second surface in contact with said catalyst, and one or more apertures extending through the thickness of said anode diffusion layer, said one or more apertures for allowing neat or concentrated fuel to effectively bypass said diffusion layer.

10. (Cancelled) The direct methanol fuel cell as in claim 9 wherein said one or more apertures are connected by one or more conduits and one more valves to a source of fuel.

11. (Cancelled) The direct methanol fuel cell as in claim 9 wherein said one or more apertures are lined with a material which is substantially impermeable to said fuel, thereby inhibiting said fuel from migrating laterally into said diffusion layer.

12. (Cancelled) A direct methanol fuel cell system comprising:

a direct methanol fuel cell including

an anode;

a cathode;

a membrane electrode assembly including a protonically conductive membrane having first and second surfaces on which catalysts are disposed, anode and cathode diffusion layers disposed, respectively, on said cata-

lysts, said anode diffusion layer having a first surface which is oriented to receive fuel and a second surface in contact with said catalyst, and one or more apertures extending through the thickness of said anode diffusion layer, said one or more apertures for allowing neat or concentrated fuel to effectively bypass said diffusion layer;

a source of neat or concentrated methanol;

a pump coupled to said methanol source and said anode for pumping fuel to said anode;

a conduit coupled to said methanol source and to one or more valves for delivering neat or concentrated methanol to said apertures in said anode diffusion layer; and

a controller coupled to said one or more valves and, responsive to an increase in demand for output power from said fuel cell, operating to one or more of said valves to allow neat or concentrated methanol to flow through said apertures.

13. (Cancelled) The system as in claim 12 wherein said one or more apertures are lined with a material which is substantially impermeable to said fuel, thereby inhibiting said fuel from migrating laterally into said diffusion layer.

14. (Cancelled) A method of rapidly increasing output power from a direct oxidation fuel cell, said method comprising the steps of:

providing a source of neat or concentrated fuel;

providing a conduit and one or more associated valves between said fuel source and an anode diffusion layer in a direct oxidation fuel cell, said layer having more apertures extending through the thickness of said layer;

sensing a demand for output power from said fuel cell;

in response to an increase in demand for power, opening or more of said valves whereby neat or concentrated fuel passes through said apertures and is applied to a protonically conductive membrane.

15. (Previously Presented) The direct methanol fuel cell system as defined in claim 1 wherein at least one of said conduits extends to a first surface of said anode diffusion layer that is oriented to receive fuel.

16. (Previously Presented) The direct methanol fuel cell system as defined in claim 1 wherein at least one of said conduits extends into said anode diffusion layer.

17. (Previously Presented) The direct methanol fuel cell system as defined in claim 1 wherein at least one of said conduits extends though said anode diffusion layer.

18. (Currently Amended) [[The direct methanol fuel cell system as defined in claim 1]] A direct methanol fuel cell system comprising:

a direct methanol fuel cell, including:

an anode;

a cathode;

a membrane electrode assembly including a protonically-conductive membrane having first and second surfaces on which catalysts are disposed, anode and cathode diffusion layers disposed, respectively, on said catalysts;

a source of fuel;

a conduit coupled to said fuel source and to one or more valves for delivering fuel to said anode; and

a controller coupled to said one or more valves and, responsive to [[an increase in demand for output power from]] a change in operating conditions of said fuel cell, operating to actuate one or more of said valves to allow a more concentrated fuel to be delivered to said anode wherein at least one of said conduits extends directly to said protonically-conductive membrane.

19. (Currently Amended) The direct methanol fuel cell system as defined in claim 1 further comprising a pump coupled [[to said methanol]] between said fuel source and said anode for pumping a more concentrated fuel to an associated anode flow field plate.

20. (Currently Amended) [[The direct methanol fuel cell system as defined in claim 1]] A direct methanol fuel cell system comprising:

a direct methanol fuel cell, including:

an anode;

a cathode;

a membrane electrode assembly including a protonically-conductive membrane having first and second surfaces on which catalysts are disposed, anode and cathode diffusion layers disposed, respectively, on said catalysts;

a source of fuel;

a conduit coupled to said fuel source and to one or more valves for delivering neat or concentrated methanol to said anode; and

a controller coupled to said one or more valves and, responsive to [[an increase in demand for output power from]] a change in operating conditions of said fuel cell, operating to actuate one or more of said valves to allow a more concentrated fuel to be delivered to said anode wherein at least one of said conduits extends directly to said catalyzed surface of the protonically-conducted membrane.

21. (Withdrawn) A method of operating a direct oxidation fuel cell, having a protonically conductive membrane with an anode catalyst on one aspect thereof, and an anode diffusion layer disposed in contact with the anode catalyst, the method including the steps of:

delivering a first fuel substance substantially comprised of at least two chemicals to the anode of the direct oxidation fuel cell during normal operating conditions; and

controllably delivering a second fuel substance under increased power demand conditions.

22. (Withdrawn) The method of operating a direct oxidation fuel cell as defined in claim 21 wherein one of said chemicals comprising said first fuel substance is a carbonaceous fuel substance.

23. (Withdrawn) The method of operating a direct oxidation fuel cell as defined in claim 22 wherein said substantially carbonaceous fuel substance includes methanol.

24. (Withdrawn) The method of operating a direct oxidation fuel cell as defined in claim 21 wherein one of said chemicals comprising said first fuel substance is water.

25. (Withdrawn) The method of operating a direct oxidation fuel cell as defined in claim 21 wherein said second fuel substance includes a carbonaceous fuel substance.

26. (Withdrawn) The method of operating a direct oxidation fuel cell as defined in claim 21 wherein said second fuel substance is neat methanol.

27. (Withdrawn) The method of operating a direct oxidation fuel cell as defined in claim 21 wherein said first fuel substance is an aqueous solution of methanol and said second fuel substance is an aqueous methanol solution that comprises a higher ratio of methanol compared to water than said first fuel substance.

28. (Withdrawn) The method as defined in claim 21 including the further step of delivering said second fuel substance responsive to an associated controller when said controller senses an increase in power demand.

29. (Withdrawn) The method as defined in claim 21 including the further step of delivering said second fuel substance to the surface of the anode diffusion layer.

30. (Withdrawn) The method as defined in claim 21 including the further step of delivering said second fuel substance into the anode diffusion layer.

31. (Withdrawn) The method as defined in claim 21 including the further step of delivering said second fuel substance directly to the anode catalyst that is disposed on or in contact with the protonically conductive membrane.

32. (Currently Amended) A direct oxidation fuel cell system, comprising:

a direct oxidation fuel cell, including:

an anode;

a cathode;

a membrane electrode assembly including a protonically-conductive membrane having first and second surfaces on which catalysts are disposed, anode and cathode diffusion layers disposed, respectively, on said catalysts;

a source of highly concentrated fuel substantially comprised of one or more carbonaceous fuel substances;

a conduit for delivering a first fuel mixture to an anode aspect of the fuel cell;

a conduit bypassing at least a portion of the first fuel mixture conduit and being coupled to said fuel source and to one or more valves for delivering [[said highly]]a more concentrated fuel to said anode; and

a controller coupled to said one or more valves and, responsive to [[an increase in demand for output power from]] a change in operating conditions of said fuel cell, oper-

ating to actuate one or more of said valves to allow highly concentrated fuel to bypass at least a portion of said first fuel mixture conduit and to be delivered to said anode.